

**Claims**

1. Laminate comprising a decorative upper layer, optionally a protective overlay and optionally a base layer, wherein said decorative upper layer comprises a web of fibers having deposited therein and/or thereon photocatalyst particles embedded in a binder.
- 5 2. Laminate comprising a decorative upper layer, a protective overlay and optionally a base layer, wherein said protective overlay comprises a web of fibers having deposited therein and/or thereon photocatalyst particles embedded in a binder.
3. Laminate according to claim 1 or 2, wherein said fibers are cellulose fibers.
4. Laminate according to any of claims 1 to 3, wherein said photocatalyst particles are selected from the group comprising  $TiO_2$ ,  $ZnO$ ,  $SiO_3$ ;  $Ti_{1-x}Sn_xO_2$ ,  $SrTiO_3$ ,  $Fe_2O_3$ ,  $CdS$ ,  $CdSe$ ,  $WO_3$ ,  $FeTiO_3$ ,  $GaP$ ,  $GaAs$ ,  $GeAs$ ,  $RuO_2$ ,  $MoS_3$ ,  $LaRhO_3$ ,  $CdFeO_3$ ,  $Bi_2O_3$ ,  $MoS_2$ ,  $In_2O_3$ ,  $CdO$ ,  $SnO_2$ ,  $SiC$ ,  $InP$  and/or mixture thereof.
- 10 5. Laminate according to claim 4, wherein said photocatalyst particles are  $TiO_2$  particles.
6. Laminate according to claim 5, wherein said  $TiO_2$  particles are anatase  $TiO_2$  particles.
- 15 7. Laminate according to any of claims 1 to 6, wherein said photocatalyst particles are doped with elements selected from the group comprising Nb, Mo, Cr, V, Cu, Mg, Ag, Ru, Au, N, Nd, Pd, Pt, Fe, Ni, Mn and the like.
8. Laminate according to any of claims 1 to 7, wherein said binder is selected from the group comprising melamine resin, urethane resin, celluloid, chitin, starch sheet,  $20$  polyvinyl alcohol, polyester resins, urea-formaldehyde, dicyandiamide-formaldehyde, epoxy resins, polyurethane resins, (poly)silane resins, (poly)siloxane resins, silazane resins, acrylamides resins, acrylic silicon resins, acrylurethane resins, polyacrylamide resins and the like and mixtures thereof.
9. Laminate according to any of claims 1 to 8, wherein said the base layer is selected  $25$  from the group comprising of fiber board, particle board, a plastic sheet and the like.
10. Laminate according to any of claims 1 to 9, further comprising at the bottom of the base layer a balancing sheet.
11. Decorative layer for laminate comprising a web of fibers having deposited therein and/or thereon photocatalyst particles embedded in a binder.
- 30 12. Decorative layer according to claim 11, wherein said fibers are cellulose fibers.
13. Decorative layer according to claims 11 or 12, wherein said photocatalyst particles are selected from the group comprising  $TiO_2$ ,  $ZnO$ ,  $SiO_3$ ;  $Ti_{1-x}Sn_xO_2$ ,  $SrTiO_3$ ,  $Fe_2O_3$ ,  $CdS$ ,

CdSe, WO<sub>3</sub>, FeTiO<sub>3</sub>, GaP, GaAs, GeAs, RuO<sub>2</sub>, MoS<sub>3</sub>, LaRhO<sub>3</sub>, CdFeO<sub>3</sub>, Bi<sub>2</sub>O<sub>3</sub>, MoS<sub>2</sub>, In<sub>2</sub>O<sub>3</sub>, CdO, SnO<sub>2</sub>, SiC, InP and/or mixture thereof.

14. Decorative layer according to claim 13, wherein said photocatalyst particles are TiO<sub>2</sub> particles.
- 5 15. Decorative layer according to claim 14, wherein said TiO<sub>2</sub> particles are anatase TiO<sub>2</sub> particles.
16. Decorative layer according to any of claims 11 to 15, wherein said photocatalyst particles are doped with elements selected from the group comprising Nb, Mo, Cr, V, Cu, Mg, Ag, Ru, Au, N, Nd, Pd, Pt, Fe, Ni, Mn and the like.
- 10 17. Decorative layer according to any of claims 11 to 16, wherein said binder is selected from the group comprising melamine resin, urethane resin, celluloid, chitin, starch sheet, polyvinyl alcohol, polyester resins, urea-formaldehyde, dicyandiamide-formaldehyde, epoxy resins, polyurethane resins, (poly)silane resins, (poly)siloxane resins, silazane resins, acrylamides resins, acrylic silicon resins, acrylurethane resins, 15 polyacrylamide resins and the like and mixtures thereof.
18. Protective overlay, wherein said protective overlay comprises a web of fibers having deposited therein and/or thereon photocatalyst particles embedded in a binder.
19. Protective overlay according to claim 18, wherein said fibers are cellulose fibers.
20. Protective overlay according to claims 18 or 19, wherein said photocatalyst particles are selected from the group comprising TiO<sub>2</sub>, ZnO, SiO<sub>3</sub>; Ti<sub>1-x</sub>Sn<sub>x</sub>O<sub>2</sub>, SrTiO<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, CdS, CdSe, WO<sub>3</sub>, FeTiO<sub>3</sub>, GaP, GaAs, GeAs, RuO<sub>2</sub>, MoS<sub>3</sub>, LaRhO<sub>3</sub>, CdFeO<sub>3</sub>, Bi<sub>2</sub>O<sub>3</sub>, MoS<sub>2</sub>, In<sub>2</sub>O<sub>3</sub>, CdO, SnO<sub>2</sub>, SiC, InP and/or mixture thereof.
21. Protective overlay according to claim 20, wherein said photocatalyst particles are TiO<sub>2</sub> particles.
- 25 22. Protective overlay according to claim 21, wherein said TiO<sub>2</sub> particles are anatase TiO<sub>2</sub> particles.
23. Protective overlay according to any of claims 18 to 22, wherein said photocatalyst particles are doped with elements selected from the group comprising Nb, Mo, Cr, V, Cu, Mg, Ag, Ru, Au, N, Nd, Pd, Pt, Fe, Ni, Mn and the like.
- 30 24. Protective overlay according to any of claims 18 to 23, wherein said binder is selected from the group comprising melamine resin, urethane resin, celluloid, chitin, starch sheet, polyvinyl alcohol, polyester resins, urea-formaldehyde, dicyandiamide-

formaldehyde, epoxy resins, polyurethane resins, (poly)silane resins, (poly)siloxane resins, silazane resins, acrylamides resins, acrylic silicon resins, acrylurethane resins, polyacrylamide resins and the like and mixtures thereof.

25. Process for the production of a decorative layer or a protective overlay according to  
5 any of claims 11 to 24, comprising the step of

- a) providing a fiber web layer
- b) treating said fiber web layer with a photocatalyst composition comprising photocatalyst particles, a binder and a solvent, and
- c) hardening said treated fiber web to obtain a decorative layer or a protective  
10 overlay comprising a web of fibers having deposited therein and/or thereon photocatalyst particles embedded in a binder.

26. Process according to claim 25, wherein said solvent is selected from the group comprising water, ethylene glycol butyl ether, ethanol and the like, and/or mixture thereof.

15 27. Process according to claim 25 or 26, wherein said treating step (b) is an impregnating step.

28. Process according to claim 25 or 26, wherein said treating step (b) is selected from the group comprising dipping, flooding, coil coating, spraying, centrifuging, screen printing, vacuum infiltrating and the like.

20 29. Process according to any of claims 25 to 28 wherein said drying step (c) comprises thermal hardening, radiation hardening and the like.

30. Finishing composition comprising (a) a photocatalyst composition as defined in claim 25, (b) a liquid carrier and (c) optionally a coacervate, wherein said photocatalyst composition comprises (i) photocatalyst particles, (ii) a binder and (iii) a solvent.

25 31. Finishing composition according to claim 30, wherein said photocatalyst particles are selected from the group comprising  $TiO_2$ ,  $ZnO$ ,  $SiO_3$ ,  $Ti_{1-x}Sn_xO_2$ ,  $SrTiO_3$ ,  $Fe_2O_3$ ,  $CdS$ ,  $CdSe$ ,  $WO_3$ ,  $FeTiO_3$ ,  $GaP$ ,  $GaAs$ ,  $GeAs$ ,  $RuO_2$ ,  $MoS_3$ ,  $LaRhO_3$ ,  $CdFeO_3$ ,  $Bi_2O_3$ ,  $MoS_2$ ,  $In_2O_3$ ,  $CdO$ ,  $SnO_2$ ,  $SiC$ ,  $InP$  and/or mixture thereof.

30 32. Finishing composition according to claim 30 or 31 wherein said photocatalyst particle is anatase  $TiO_2$ .

33. Finishing composition according to claim 30 or 31, wherein said coacervate is selected from the group comprising Levalin VKU-N (Bayer), Primasol SD (BASF), Irgapadol PN New (Ciba), Lyogen AF (Clariant AG), Intratex AF (Crompton & Knowles) and the like.
34. Finishing composition according to any of claims 30 to 33, further comprising soil and/or stain resists products.
- 5 35. Finishing composition according to any of claims 30 to 34, wherein the liquid carrier and the solvent are each independently selected from the group comprising water, alkylene glycols, polyalkylene glycols, alkylene carbonates, ethanol, propanol and isopropanol and mixtures thereof.
- 10 36. Finishing composition according to any of claims 30 to 35, wherein said binder is selected from the group comprising melamine resin, urethane resin, celluloid, chitin, starch sheet, polyvinyl alcohol, polyester resins, urea-formaldehyde, dicyandiamide-formaldehyde, epoxy resins, polyurethane resins, (poly)silane resins, (poly)siloxane resins, silazane resins, acrylamides resins, acrylic silicon resins, acrylurethane resins, 15 polyacrylamide resins and the like and mixtures thereof.
37. Finishing composition according to any of claims 30 to 36, wherein said binder is in an amount ranging from 0.01 to 5 % by weight of the photocatalyst composition, preferably from 0.01 to 1% by weight, more preferably from 0.05 to 0.3 %.
- 20 38. Finishing composition according to any of claims 30 to 37, wherein said photocatalyst particles is in an amount ranging from 0.01 to 5 % by weight of the photocatalytic composition, preferably from 0.01 to 1% by weight and most preferably from 0.05 to 0.3 %.
- 25 39. Finishing composition according to any of claims 30 to 38, wherein the photocatalyst composition in a concentration comprised between 1 to 50 % by weight, preferably from 5 to 35 % by weight, more preferably from 7 to 20 % by weight, yet more preferably from 7 to 13 % by weight, most preferably from 8 to 9 %.
40. Use of a finishing composition according to any of claims 30 to 39, for the treatment of carpets.
41. Method for the preparation of a carpet having air clarifying properties comprising the 30 steps of: providing a finishing composition according to any of claims 30 to 39, and applying said finishing composition onto a carpet thereby obtaining a carpet having air clarifying properties.

42. Method according to claim 41, wherein said finishing composition is provided as a foam.
43. Method according to claim 42, wherein the finishing composition is applied by means of a foam applicator.
- 5 44. Carpet having air clarifying properties obtained by a method according to any of claim 41 to 43.